An Historical Overview of the Docee River Enumeration Program 1963-1987

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ABSTRACT

Thomson, B.L. and R. D. Goruk. 1988. An historical overview of the Docee River enumeration program 1963-1987. Can. Data Rep. Fish. Aquat. Sci. 702:iii + 8 p.

This report reviews the Docee River sockeye enumeration program conducted in the Department of Fisheries and Oceans Statistical Area 10 for the years 1963-1987. A permanent counting fence was built in 1972 to replace a counting tower located at the head of Docee River. Daily sockeye escapement numbers collected at the fence are used in conjunction with commercial catch figures in the in-season managment of the Area 10 Smith Inlet sockeye fishery.

RESUME

Thomson, B.L. and R. D. Goruk. 1988. An historical overview of the Docee River enumeration program 1963-1987. Can. Data Rep. Fish. Aquat. Sci. 702:iii + 8 p.

Ce rapport examine le programme de dénombrement des saumons rouges réalisé dans la zone 10 de Pêches et Océans, entre 1963 et 1987. Une barrière de comptage permanente a été construite en 1972, pour remplacer une tour de comptage située en amont sur la rivière Docee. Les données sur le nombre quotidien d'échappées de saumons rouges recueillies à la barrière et les données de la pêche commerciale servent à la gestion en saison de la zone 10 (Smith Inlet) de la pêche au saumon rouge.

INTRODUCTION

Statistical Area 10 (Smith Inlet) is situated to the northeast of Vancouver Island in the southernmost portion of the Central Coast of British Columbia (Fig. 1). The sockeye stock is the largest and most important salmon stock in Smith Inlet. The stock spawns in two streams, Smokehouse Creek, which accommodates approximately 75% of the spawning stock, and Canoe Creek.

The two creeks flow into Long Lake which is connected by the Docee River to Wyclees Lagoon (Fig. 2). A tidal narrows commonly called the Quashella Narrows, joins the lagoon to Smith Inlet.

Sockeye normally appear at the mouth of the Quashella towards the end of June. From this period to the beginning of August, the sockeye migrate into Wyclees Lagoon. Migration into the lagoon is influenced by the tides with major migrations often taking place during high tides. The sockeye then move up the Docee River into Long Lake where they hold until early September. Spawning usually peaks in October and is usually finished by early to mid-November (Wood 1970).

Prior to 1963, sockeye enumerations of Long Lake were conducted from visual surveys of Smokehouse and Canoe Creeks. In 1963 a count of sockeye entering Long Lake was conducted from a tower on the Docee River as an experimental program to provide improved estimates in a time frame useful for inseason management. After a lapse of 4 years the tower count was again conducted in 1968, 1970 and 1971. The results from these programs demonstrated that Docee River counts provided more effective management of the Smith Inlet sockeye fishery and more accurate monitoring of escapement estimates. A permanent counting facility was constructed for the 1972 season, and the Docee Fence has operated annually from 1972 to present.

Currently, the Docee River fence counts are used in combination with catch information in the in-season management of the Area 10 Sockeye fishery. Stock status determinations for Smith Inlet sockeye are based on abundance and age structure data collected at the fence.

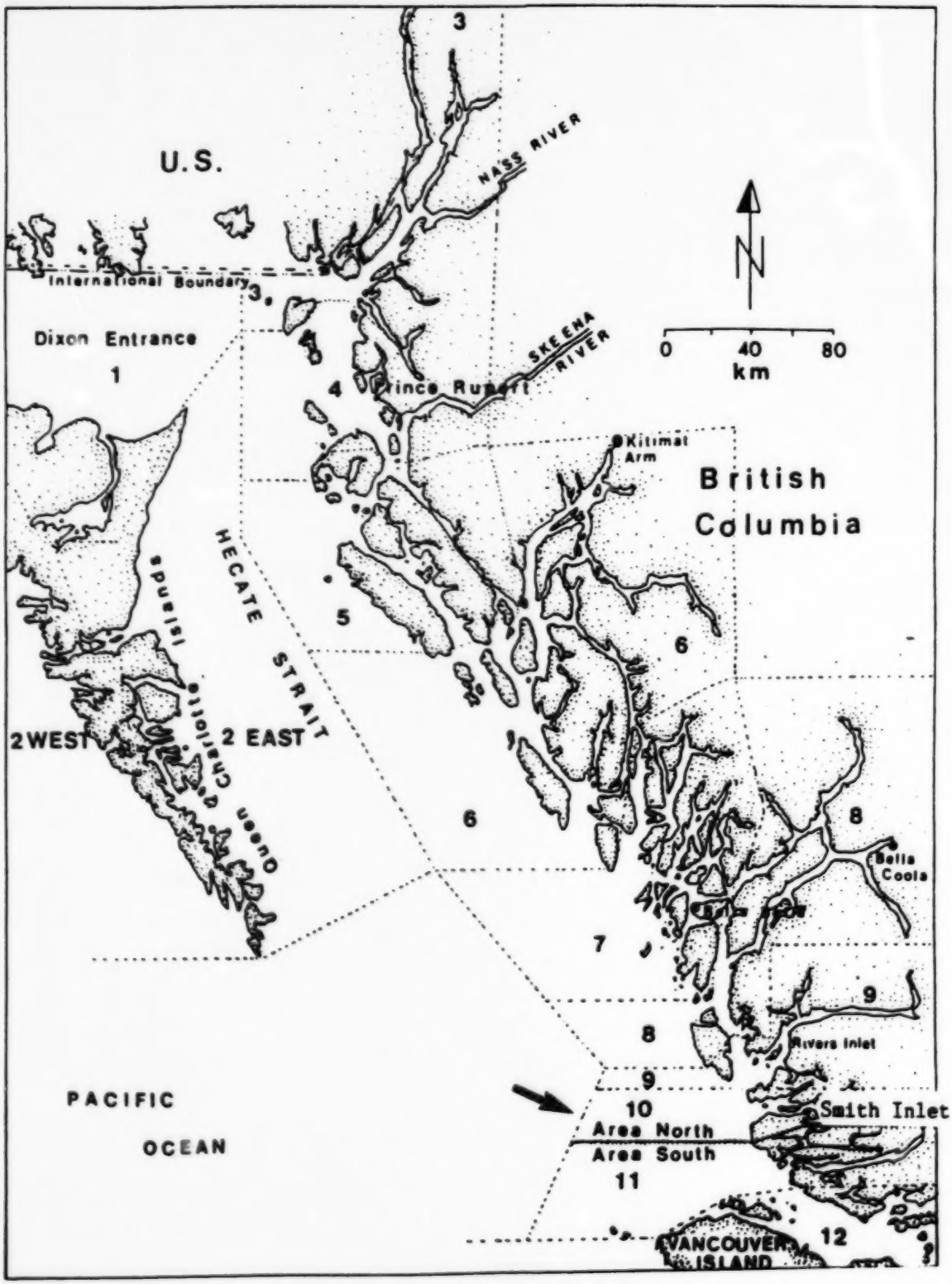

FIGURE 1. Location of Department of Fisheries and Oceans Statistical Area 10.

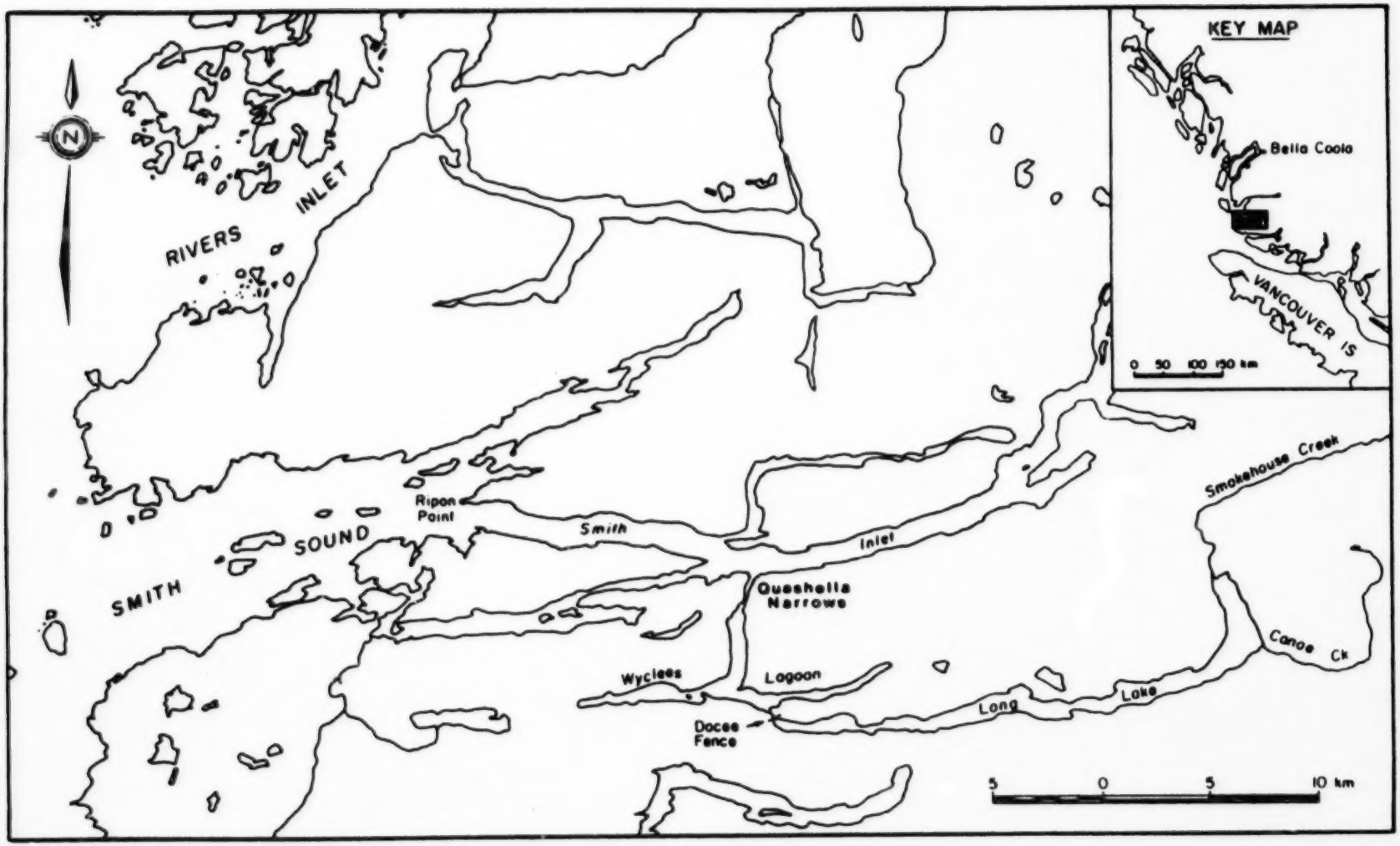

FIGURE 2. Smith Inlet and associated tributaries.

METHODS

The Smith Inlet sockeye enumeration program began in 1963. The initial site selected for sockeye enumeration was at the head of the Quashella near its outlet to Smith Inlet. The Quashella tidal narrows undergoes flow reversals at high tide, carrying saltwater into the lagoon. Water depth and velocity, and the poor visibility caused by the tidal changes proved this site to be impractical for enumeration purposes (Wood 1970).

A second site was selected at the head of the Docee River, near where it drains Long Lake into the lagoon. A counting tower was established in July of 1963 and operated until the beginning of August. To improve countability, a strip of white sandbags was laid down across the river. Counts were conducted on a daily basis between 5:00 AM and 10:00 PM on a 15 minute on-15 minute off basis. Periodic 24 hour counts were conducted to determine the degree of migration occurring outside the daily counting period. Lights were used during hours of darkness to illuminate the streambed.

The results of the initial Docee River study indicated that the site could be used to accurately determine sockeye escapements into Long Lake and that the magnitude of these escapements could be used in the management of the Smith Inlet sockeye stock (Wood 1970).

The program was not operated in 1964 due to problems with flooding, and was not restarted until 1968. Although the program was once again inoperational in 1969 due to flooding, it was restarted again in 1970. The tower counts though usually providing a good estimate of sockeye escapement were hampered by poor visibility in bad weather or at times of high water. The counts were also subject to a high degree of error during peak migration when large numbers of fish passed by in short periods of time across the entire river (Wood 1970). In the 1968 season, a recommendation was made to establish a permanent counting facility at the Docee site. The Docee counting tower program was continued until 1971, being replaced by a counting fence in 1972.

Construction of the Docee counting fence foundation was begun in February of 1972 and was completed by late June. The fence has been in operation on an annual basis from 1972 to the present.

Currently, the fence is put into place at the end of June and removed during the second week of August. Depending on the magnitude of the run, the fence is operated during the hours of 5:00 AM to 10:00 PM or dusk. During dark hours, the fence is closed keeping migrating sockeye below the structure. Night counts are not conducted as the lighting tends to affect fish behavior through the fence, resulting in unnecessary mortality. Fish are counted as they pass through a gate over a section of white expanded metal on the counting panels.

Tables 1 and 2 detail the historic daily and cumulative sockeye counts through the Docee River Tower and Docee River Fence for the years 1963, 1968, 1970–1987.

TABLE 1. DOCEE RIVER DAILY SOCKEYE COUNTS (1963, 1968, 1970-71 DOCEE TOWER, 1972-1987 DOCEE FENCE).

		1963	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
JUNE	26																				3
	27																				2
	28																		1		10
	29																		9	1	6
	30																		0	25	3
JULY	1															20		1	19	553	22
	2															84	37	6	478	526	7
	3															26	24	21	427	213	29
	4											7400				21	14	12	657	84	8
	5											100				8823	10	9	716	34	177
	6											300				10569	14	23	3651	31	1374
	7								503			200				12640	10	4	5116	176	5027
	8		66					1000	233	1311		1553		1000		11476	35	15	9656	10543	906
	9		970	200				3174	22	99	6687	520		600		1533	18195	3395	19651	3227	371
	10		18336	7930			41173	933	10	5	12342	4759	25	13742		176	15014	2762	10782	402	71
	11		7902	3566			12517	2977	6	4	5349	8866	315	8023		20	9639	6011	7481	60	48
	12	6066	13963	1546		15666	8349	1296	17	4	4967	4508	1306	11687	5534	22	8924	1458	14715	90	55
	13	4412	19074	2520	7	6365	38409	2302	3	21652	8164	752	2583	8424	6659	69654	21927	309	16720	70	7568
	14	6980	13515	5772	190	1466	24806	20810	9	3379	4094	550	178	18424	4155	16226	19490	296	11034	18794	17524
	15	5813	24558	5397	13433	75	12546	37265	3	1660	3883	1057	213	3665	5000	10551	26781	21588	14901	18275	9763
	16	6350	27705	1882	12406	25	5318	17814	8	184	197	4853	528	6447	9870	7481	28885	10194	24109	5790	4140
	17	7141	24134	11366	9623	23501	3623	447	438	7	19640	11502	505	6932	16189	4806	15303	5758	17656	1701	1813
	18	8629	28030	5086	8282	13239	5836	18	14321	8	12975	4855	1035	6663	13806	5758	13598	4083	10062	1311	150
	19	7075	6292	10608	30772	5263	1073	80	6438	14	21133	3563	1389	3624	24543	14938	6362	1912	9751	4113	65
	20	2140	4787	7616	20445	1962	2018	236	4537	0	9881	6309	380	3424	28033	11929	732	2636	11602	6535	34
	21	2222	3907	5696	17360	1115	2527	814	729	4	2549	3254	266	2071	26114	3565	52	1757	12943	17950	16
	22	22	2737	800	13155	3802	2780	433	7277	0	4748	1920	295	1567	38158	2673	244	557	2368	14675	54
	23	21	1954	85	3142	902	5835	207	9560	4073	2456	155	288	5425	20158	1768	249	737	3642	3347	47
	24	10			3482	75	423	193	4852	15530	981	108	355	3680	5690	1737	389	651	6708	9491	18
	25	95			1239	275	257	369	4485	8270	3284	124	431	3630	2583	3661	414	1825	5174	9254	29574
	26	45			1068	760	70	119	3526	3166	484	290	343	5090	1605	1762	59	3052	3276	11367	26232
	27	3094			436	1440	151	155	1452	1210	1052	1383	241	5218	308	3392	169	637	3375	6242	47933
	28	6427			0	74	36	75	1076	160	1787	2680	198	2745	301	921	620	729	1520	6722	29206
	29	1931			35	136	227	42	2120	7	753	1896	118	3018	948	1808	1329	8432	1341	8908	8064
	30	91				47	287	6	583	122	752	1291	57	1858	2448	516	2892	6974	1964	5411	829
	31	28				60	247	174	559	50	457	1020	463	1166	882	515	992	1226	2837	6176	585
AUG.	1	94					188	74	200		273	1055	2223	172	617	695	988	532	3673	4258	702
	2						271				213	2181	4689	144	153	1031	536	328	1645	4991	393
	3						151					3212	833	256	156	416	613	313	1396	5961	347
	4						145					1668	263	536	189	531	920	394	2146	5177	149
	5						62					131	195	204	20	606	1032	317	1130	3504	98
	6						76						214		95	715	1159	58	587	1576	101
	7						50						260		75	326			571	627	51
	8						59						68		56	274			1560	160	60
	9						201									109					
	10						33														
	11						11														
	12						30														
TOTAL		68686	197930	70070	135075	76248	169785	91013	62967	60919	128601	84015	20257	129435	214345	213674	197151	89012	247050	197851	193781
POST-SEASON ADJUSTED TOTAL (1983-1987)																	(199653)	(89012)	(250000)	(199000)	(200000)

TABLE 2. DOCEE RIVER CUMULATIVE SOCKEYE COUNTS (1963, 1968, 1970-71 DOCEE TOWER, 1972-1987 DOCEE FENCE).

		1963	1968	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
																					3
JUNE	26																				5
	27																		1		15
	28																		10	1	21
	29																		10	26	24
	30															20		1	29	579	46
JULY	1															104	37	7	507	1105	53
	2															130	61	28	934	1318	82
	3											7400				151	75	40	1591	1402	90
	4											7500				8974	85	49	2307	1436	267
	5											7800				19543	99	72	5958	1467	1641
	6								503			8000				32183	109	76	11074	1643	6663
	7								736	1311		9553		1000		43659	144	91	20730	12186	7569
	8		66					1000	758	1410	6687	10073		1600		45192	18339	3486	40381	15413	7890
	9		1036	200				4174	768	1415	19029	14832	25	15342		45318	33353	6248	51163	15815	7961
	10		19372	8130			41173	5107	768	1419	24378	23698	340	23465		45338	42992	12259	58644	15875	8009
	11		27274	11696			53690	8084	774	1423	29345	28706	1646	35052	5534	45360	51916	13717	73359	15965	8064
	12	6066	41237	13242		15666	62039	9380	791	1423	29345	28958	4229	43476	12193	115014	73843	14026	90079	16035	15632
	13	10478	60311	15762	7	22031	100448	11682	794	23075	37509	29508	4407	61900	16348	131240	93333	14322	101113	34829	33156
	14	17458	73826	21534	197	23497	125254	32492	803	26454	41603	30565	4670	65565	21348	141791	119614	35910	116014	53104	42919
	15	23771	98384	26931	13630	23572	137800	69757	806	28114	45486	35418	5148	72012	31218	149272	148499	46104	140123	58394	47259
	16	29621	126089	28813	26036	23597	143118	87571	814	28298	45683	46920	5653	78944	47407	154078	163802	51862	157779	60095	49073
	17	36762	150223	40179	35659	47098	146741	88018	1252	28305	65323	51775	6688	85607	61213	159836	177400	55945	167841	61406	49223
	18	45391	178253	45265	43941	60337	152577	88036	15573	28313	78798	55338	8077	89231	85756	174774	183762	57857	177592	65519	49288
	19	52466	184545	55873	74713	65600	153650	88116	22011	28327	99431	61647	8457	92655	113789	186703	184494	60493	189194	72054	49322
	20	54606	189332	63489	95158	67562	155668	88352	26548	28327	109312	64901	8723	94726	139903	190268	18 6	62250	202137	90004	49338
	21	56828	192739	69185	112518	68677	158195	89166	27277	28331	111861	66821	9018	96293	178061	192941	184790	62807	204505	104679	49397
	22	56850	195976	69985	125673	72479	160975	89599	34554	28331	116609	66976	9306	101718	198219	194709	185039	63544	208147	108026	49439
	23	56871	197930	70070	128815	73381	166810	89806	44114	32404	119065	67084	9661	105398	203909	196446	185428	64195	214855	117517	49457
	24	56881			132297	73456	167233	89999	48966	47934	120046	67208	10092	109028	206492	200107	185842	66020	220029	126771	79031
	25	56976			133536	73731	167490	90368	53451	56204	123330	67498	10435	114118	208097	201869	185901	69072	223305	138138	105263
	26	57021			134604	74491	167560	90487	56977	59370	123814	68881	10676	119336	208405	205261	186070	69709	226680	144380	153196
	27	60115			135040	75931	167711	90642	58429	60580	124866	71561	10874	122081	208706	206182	186690	70438	228700	151102	182402
	28	66542			135040	76005	167747	90717	59505	60740	126153	73457	10992	125099	209654	207990	188019	78870	229541	160010	190466
	29	68473			135075	76141	167974	90759	61625	60747	126906	74748	11049	126957	212102	208506	190911	85844	231505	165471	191795
	30	68564				76188	168261	90765	62208	60869	127658	75768	11512	128123	212984	209021	191903	87070	234342	171597	191880
	31	68592				76248	168508	90939	62767	60919	128115	76823	13735	128295	213601	209716	192891	87602	238015	175855	192582
AUG.	1	68686					168696	91013	62967		128388	79004	18424	128439	213754	210747	193427	87930	239660	180046	192975
	2						168967				128601	82716	19257	128695	213910	211163	194040	88243	241056	186807	193322
	3						169118					83884	19570	129231	214099	211694	194960	88637	243202	191984	193471
	4						169263					84015	19715	129435	214119	212300	195992	88954	244332	195488	193569
	5						169325						19929		214214	213015	197151	89012	244919	197064	193670
	6						169401						20189		214289	213341			245490	197691	193721
	7						169451						20257		214345	213565			247050	197851	193781
	8						169510									213674					
	9						169711														
	10						169744														
	11						169755														
	12						169785														
TOTAL		68686	197930	70070	135075	76248	169785	91013	62967	60919	128601	84015	20257	129435	214345	213674	197151	89012	247050	197851	193781
POST-SEASON ADJUSTED TOTAL (1983-1987)																	(199653)	(89012)	(250000)	(199000)	(200000)

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